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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/667,523	09/23/2003	Christoph Brabec	32860-000625/US	2570

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EXAMINER	
WEBB, CHRISTOPHER G	

ART UNIT	PAPER NUMBER
2878	

DATE MAILED: 06/30/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

Office Action Summary	Application No.	Applicant(s)	
	10/667,523	BRABEC ET AL.	
	Examiner	Art Unit	
	Christopher G. Webb	2878	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-34 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-34 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 23 September 2003 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 20030923.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-2, 4-5, 7-9, 12-13, 15, 17, 20, 26, 28-29, 31-32, and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshida in view of Saricifici et al. (US 5,454,880, hereafter Saricifici).

With respect to claim 1, Yoshida discloses an X-ray detector comprising: a phosphor layer (fig. 2, element 1), adapted to generate electromagnetic radiation as a function of the occurrence of X-radiation; and a photodetector layer (fig. 2, element 10), adapted to detect electromagnetic radiation generated by the phosphor layer, wherein the phosphor layer includes ceramic material (col. 3, line 8) and the photodetector layer is joined to the phosphor layer (fig. 2). Yoshida does not disclose that the photodetector layer includes organic material. Saricifici teaches the use of organic materials to make a photodiode. It would have been obvious at the time of invention to one of ordinary skill in the art to use the photodiode taught by Saricifici as the photodetector layer of Yoshida. The use of organic materials provides "significant cost advantages" as well as "excellent mechanical properties" (col. 2, lines 6-19).

As to claims 2 and 29, Yoshida discloses that the ceramic material can be Gd_2O_2S (col. 3, line 8).

As to claims 4 and 31, Yoshida discloses that the device further comprises an intermediate layer (fig. 2, element 9) between and joined to the phosphor layer and the photodetector layer.

As to claims 5 and 32, Yoshida discloses that the intermediate layer includes a polymer (col. 3, lines 54-60).

As to claim 7, Yoshida discloses that a bottom electrode is provided (fig. 2, element 6). Yoshida does not disclose that the electrode includes an oxide. Saricifci teaches the use of an electrode that includes an oxide (col. 8, lines 30-31). It would have been obvious at the time of invention to one of ordinary skill in the art to use the oxide as taught by Saricifci as the bottom electrode disclosed by Yoshida. Using an oxide allows for a choice of electrode material that is transparent to the wavelengths of interest.

As to claim 8, Yoshida does not disclose an oxide that is ITO. Saricifci teaches that the oxide is ITO. It would have been obvious at the time of invention to one of ordinary skill in the art to choose ITO as the specific oxide as noted above with respect to claim 7.

As to claims 9 and 26, Yoshida discloses a top electrode (fig. 2, element 15) joined to the photodetector layer.

As to claims 12 and 34, Yoshida discloses a CT device comprising the X-ray detector of claim 1 (col. 1, lines 8-9).

As to claim 13, Yoshida discloses an X-ray detector comprising: producing the phosphor layer from ceramic material (col. 3, lines 7-9) and applying the photodetector

layer via phosphor layer via at least one of spinning processing, printing processing, beam/jet processing and sticking the photodetector layer on the phosphor layer as a film (col. 4, lines 57-60). Yoshida does not disclose that the photodetector layer includes organic material. Sariciftci teaches the use of organic materials to make a photodiode. It would have been obvious at the time of invention to one of ordinary skill in the art to use the photodiode taught by Sariciftci as the photodetector layer of Yoshida as noted above with respect to claim 1.

As to claim 15, Yoshida discloses the step of applying an intermediate layer to the phosphor layer via at least one of spinning processing, printing processing, beam/jet processing and sticking the photodetector layer on the phosphor layer as a film (col. 4, lines 24-28), before applying the photodetector layer (col. 4, lines 57-60).

As to claims 17 and 20, Yoshida discloses that the device further comprises an intermediate layer (fig. 2, element 9) between and joined to the phosphor layer and the photodetector layer.

As to claim 28, Yoshida discloses an X-ray detector comprising: means for generating electromagnetic radiation as a function of the occurrence of X-radiation (col. 1, lines12-14), including a phosphor layer (fig. 2, element 1) and means for detecting electromagnetic radiation generated by the phosphor layer (col. 1, lines 14-16), including a photodetector layer (fig. 2, element 10), wherein the phosphor layer includes ceramic material (col. 3, line 8) and the photodetector layer is joined to the phosphor layer (fig. 2). Yoshida does not disclose that the photodetector layer includes organic material. Sariciftci teaches the use of organic materials to make a photodiode. It would

have been obvious at the time of invention to one of ordinary skill in the art to use the photodiode taught by Sariciftci as the photodetector layer of Yoshida as noted above with respect to claim 1.

Claims 3, 16, 18-19, 22, 24, and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshida in view of Sariciftci as applied to claims 1, 2, 28 above, and further in view of Feygin (US 2002/0182111 A1, hereafter Feygin).

With respect to claims 3, 16, and 30, Yoshida does not disclose specific organic materials. Sariciftci teaches the use of p-type (col. 4, line 60) PPV (fig. 1F) and n-type fullerenes (col. 5, lines 3-4). Sariciftci also notes that "only the fullerene moiety is required" for its use as an acceptor. Yoshida in view of Sariciftci does not teach the use of fullerene-PCBM as the specific fullerene. Feygin teaches the use of fullerene-PCBM with P3AT (paragraph [0059], lines 3-5). It should also be noted that Sariciftci also teaches the use of P3AT (fig. 1K) with a fullerene. It would have been obvious at the time of invention to one of ordinary skill in the art to use fullerene-PCBM as the n-type fullerene taught by Sariciftci with the p-type PPV. As noted by Feygin, fullerene-PCBM is useful for imaging applications in the visible spectrum.

As to claims 18 and 19, Yoshida discloses that the device further comprises an intermediate layer (fig. 2, element 9) between and joined to the phosphor layer and the photodetector layer.

As to claims 22 and 24, Yoshida discloses that the intermediate layer includes a polymer (col. 3, lines 54-60).

Claims 6, 21, and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshida in view of Sariciftci as applied to claim 5, 20, and 32 above, and further in view of Tyan (US 6,693,296 B1, hereafter, Tyan).

With respect to claims 6, 21, and 33, Yoshida in view of Sariciftci does not disclose that the polymer is PEDOT-PSS. Tyan teaches an organic diode that uses PEDOT-PSS with PPV. It would have been obvious at the time of invention to one of ordinary skill in the art to use PPV as the intermediate layer polymer taught by Yoshida in view of Sariciftci. PEDOT-PSS is known to be conductive, transparent to visible light, and stable under normal conditions, and it would therefore be a desirable compound for use with an organic photodetector.

Claims 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshida in view of Sariciftci as applied to claim 9 above, and further in view of Parthasarathy et al. (US 5,506,409, hereafter Parthasarathy).

With respect to claim 10, Yoshida in view of Sariciftci does not disclose that the top electrode includes a metal or a metal alloy. Parthasarathy teaches an electrode comprised of a metal (col. 2, lines 62-64). It would have been obvious at the time of invention to one of ordinary skill in the art to use the electrode taught by Parthasarathy in the apparatus taught by Yoshida in view of Sariciftci. The electrode is desirable because of its low work function.

As to claim 11, Yoshida in view of Sariciftci does not disclose that the top electrode includes a conductive polymer. Parthasarathy teaches an electrode comprised of a conductive polymer (col. 7, lines 23-25). It would have been obvious at the time of invention to one of ordinary skill in the art to use the electrode taught by Parthasarathy in the apparatus taught by Yoshida in view of Sariciftci. The electrode is desirable because it is transparent in the region of interest and also conductive.

Claims 14 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshida in view of Sariciftci as applied to claim 13 above, and further in view of Possin et al. (US 2003/0122083 A1, hereafter Possin).

With respect to claim 14, Yoshida does not disclose the step of polishing the phosphor layer before applying the photodetector layer. Possin teaches the step of polishing the phosphor layer (claim 21, lines 10-11) before applying the photodetector layer (claim 21, lines 16-30).

As to claim 27, Yoshida discloses the step of applying an intermediate layer to the phosphor layer via at least one of spinning processing, printing processing, beam/jet processing and sticking the photodetector layer on the phosphor layer as a film (col. 4, lines 24-28), before applying the photodetector layer (col. 4, lines 57-60).

Claims 23 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshida in view of Sariciftci and Feygin as applied to claims 22 and 24 above, and further in view of Tyan.

With respect to claims 23 and 25, Yoshida in view of Sariciftci and Feygin does not disclose that the polymer is PEDOT-PSS. Tyan teaches an organic diode that uses PEDOT-PSS with PPV. It would have been obvious at the time of invention to one of ordinary skill in the art to use PPV as the intermediate layer polymer taught by Yoshida in view of Sariciftci. PEDOT-PSS is known to be conductive, transparent to visible light, and stable under normal conditions, and it would therefore be a desirable compound for use with an organic photodetector.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US 4,242,221 and US 6,373,061 B1 also disclose relevant prior art.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher G. Webb whose telephone number is (571) 272-8449. The examiner can normally be reached on 9AM - 5:30PM M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David P. Porta can be reached on (571) 272-2444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

CGW

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